



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Malhotra et al.

Title: Magnetic Recording Medium Having Novel Underlayer Structure

Serial No.: 10/761,820

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Examiner: Holly C. Rickman

Art Unit: 1773

Docket No.: K2003010

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

DECLARATION

I, Sudhir Malhotra, Declare:

1. I earned my BS in Material Science at Bombay University in 1985. I earned my MS in Physics at Creighton University in 1990. I earned my PhD degree in Physics/Material Science at University of Nebraska in 1996.

2. I worked as an engineer at HMT from 1996 to 2000, specializing in magnetic recording media. I have been employed at Komag, Inc. since 2001. My current title is R&D Director. I specialize in magnetic recording media.

3. I am a coinventor in U.S. Patent Application 10/761,820 (the "Application"). I have read and understand the Application. I have also read and understand U.S. Patents 6,645,551 ("Wong") and 6,830,837 ("Kanbe").

4. The present application contains claims directed toward a magnetic recording medium comprising a substrate 102a, first bcc underlayer 104a, second bcc underlayer

104b, third bcc underlayer 104c, and a magnetic layer 106. The underlayers comprise Cr. The second underlayer 104b contains B.

5. Adding B to underlayer 104b causes a reduction in crystal size in magnetic layer 106, and reduces the noise exhibited by the recording medium. This is explained in Application paragraph 7. We discovered that by forming third underlayer 104c over underlayer 104b and providing B in underlayer 104b instead of underlayer 104c, we can achieve superior noise characteristics. This surprising result is neither taught nor suggested by Kanbe or Wong.

6. We performed experiments that demonstrate the surprisingly superior results described in paragraph 5 above. For example, as shown in Application Table V, in a disk comprising a first underlayer comprising Cr and a second underlayer comprising CrMoB, we measured media SNR (signal to noise ratio) at 21.5 dB. By providing a CrMo third underlayer over the CrMoB second underlayer, we were able to increase the SNR to 22.9 dB. This result was significant and unexpected.¹ There is nothing in Wong and Kanbe that would have suggested this result.

7. Wong teaches a magnetic disk with a plurality of underlayers 18, 20 having different alloy compositions, with different lattice spacing. (Wong's objective is to provide a Cr underlayer that has a desired lattice spacing.) There is no reason one skilled


¹ The underlayers in Table V were all bcc underlayers.

in the art would know from Wong what affect would be achieved by putting boron in any of the underlayers.

8. Kanbe discusses a magnetic medium comprising one or two Cr bcc underlayers (see Col. 6-7). In each instance, Kanbe advocates adding B to the uppermost Cr bcc underlayer. Kanbe does not teach or suggest adding B to any Cr bcc underlayer other than the uppermost Cr bcc underlayer. Therefore, Kanbe does not teach or suggest that anything positive would occur by placing B any bcc Cr underlayer other than the uppermost bcc Cr underlayer.

9. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under 18 USC 1001 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Respectfully submitted,


Sudhir Malhotra

Date: Feb. 22, 2006



I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on March 1, 2006.

March 1, 2006

Date

A handwritten signature in cursive script, appearing to read "W. H. Reed".

Signature